AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Original):   A method of inspecting a continuously moving web, comprising:

a)   imaging a sequential portion of the continuously moving web to provide a digital data stream,

b)   forming a blob list from the data stream, and

c)   analyzing blobs on the blob list to identify defects, wherein b) and c) occur in a single computer.

Claim 2 (Original):   A method according to claim 1, further comprising binarizing said digital data stream prior to forming said blob list.

Claim 3 (Currently Amended):   A method according to claim 2, wherein the digital data stream corresponding to each sequential portion describes pixels in an X domain corresponding to their position across the web, and wherein the forming step comprises:

determining collections of pixels connected to each other in the X domain so as to define segments;

resolving line to line whether connections exist between segments in a Y domain corresponding to the direction of web movement; wherein

the determining step and the resolving step are accomplished in a single iteration.

Claim 4 (Original):   A method according to claim 3, further comprises saving in turn a list of the segments in each sequential line as a comparison list, and wherein

the resolving comprises comparing the segment list for the current line with the comparison list.

Claim 5 (Currently Amended):   The method according to claim 1, wherein the web is a patterned web, and further comprising binarizing the digital data steam, the binarizing comprising:

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identifying at least one sequential portion having substantially the entire range of optical properties characteristic of the web;

identifying the pixel values corresponding to local maxima and minima;

defining a range bounded by the lowest value among the pixel values identified as local maxima and the highest value among the pixel values identified as local minima;

calculating a threshold value within the range; and

comparing at least a portion of the digital data stream to the threshold value.

Claim 6 (Currently Amended):   A method according to claim 1, wherein a filter is applied to the digital data stream in the single computer prior to forming the blob list.

Claim 7 (Original):   A method according to claim 1, further comprising communicating between the single computer and a process control system.

Claim 8 (Original):   A method according to claim 1, further comprising marking identified defects on the continuously moving web.

Claim 9 (Original):   A method according to claim 8, wherein said marking occurs through ink deposition, paint deposition, laser tagging, label application, hold punching, physical deformation, magnetic pulsing or combinations thereof.

Claim 10 (Original):   A method according to claim 8, wherein said marking occurs substantially near the point of occurrence of the defect.

Claim 11 (Original):   A method according to claim 1, wherein said web is selected from metals, paper, polymeric films, wovens, non-wovens, glass or combinations thereof.

Claim 12 (Original):   A method according to claim 11, wherein one or more coatings or one or more patterns are applied to said web.

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Claim 13 (Original):   A method according to claim 12, wherein said continuously moving web is a flexible circuit web.

Claim 14 (Original):   A method according to claim 1, wherein said imaging occurs through reflected light transmitted light or transflected light.

Claim 15 (Original):   A method according to claim 1, wherein multiple imaging sources are utilized.

Claim 16 (Original):   A method according to claim 2, wherein said binarizing includes adaptive thresholding or multiple value thresholding.

Claim 17 (Original):   A method according to claim 1, wherein said data stream is at least 10 mega-pixels/second.

Claim 18 (Original):   A method according to claim 1, further comprising classifying defects into specific categories.

Claim 19 (Original):   A method of inspecting continuously moving articles on a web, comprising analyzing blobs formed from a continuous digital data stream of at least 10 mega-pixels/second imaged from at least a portion of a continuously moving article to identify defects on the articles, wherein the blobs are formed and analyzed in a single computer.

Claim 20 (Original):   A method for inspecting continuously moving webs having a repeating pattern, the method comprising:

    a)   imaging sequential portions of the continuously moving web to provide a digital data stream,

    b)   identifying instances of the repeating pattern,

    c)   forming a blob list representative of each instance of the repeating pattern from the data steam, and

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d)   analyzing blobs on the blob list to identify defects, wherein c) and d) occur in a
        single computer

Claim 21 (Original):   A method according to 20, wherein the number of blobs on the blob list for
each instance of the repeating pattern is compared against a predetermined number.

Claim 22 (Currently Amended):   A method according to 20, wherein positional and geometric
properties of each blob is are compared against a corresponding blob in a reference blob list.

Claim 23 (Original):   A method according to 20, wherein
        the digital data stream corresponding to each sequential portion describes pixels in an X
domain corresponding to their position across the web, and wherein
        the blob list includes information on the lengths of collections of pixels connected to each
other in the X domain; and further wherein the analyzing step comprises
        calculating information on the lengths of collections of pixels connected to each other in a
Y domain corresponding to the direction of web movement;
        modifying the lengths of the collections of pixels in at least one of the X domain, the Y
domain, or both domains, by a first predetermined number;
        preparing a new blob list based on the modified lengths; and
        comparing the number of blobs on the new blob list against a second predetermined
number.

Claim 24 (Original):   A method according to 20, wherein said imaging occurs through reflected
light, transmitted light or transflected light.

Claim 25 (Original):   A method according to claim 20, wherein the data stream is utilized to find
individual patterns on said web without external synchronization.

Claim 26 (Original):   A method according to claim 20, further comprising binarizing of said
digital data stream prior to forming said blob list.

Claim 27 (Original):   A method according to claim 26, wherein said binarizing occurs using adaptive thresholding or multiple value thresholding.

Claim 28 (Original):   A method according to claim 20, wherein said continuously moving web is a flexible circuit web.

Claim 29 (Original):   A method according to claim 28, wherein said defects include one or more of shorts, opens, lead reductions, space reductions, substrate defects, pattern misregistration, bent leads, covercoat defects, lamination defects, stains, or debris.

Claim 30 (Original):   A method according to claim 20, further comprising marking one or more defects on said continuously moving web.

Claim 31 (Original):   A method according to claim 20, wherein said marking occurs substantially near the point of occurrence of the defect.

Claim 32 (Currently amended):   A method according to claim 20, wherein said computer communicates with a process control system for that controls said continuously moving web.

Claim 33 (Original):   A method according to claim 20, wherein said imaging device is spatially synchronized to the continuously moving web.

Claim 34 (Original):   A method according to claim 20, wherein multiple imaging sources are utilized.

Claim 35 (Original):   A method according to claim 20, further comprising classifying defects into specific categories.

Claim 36 (Original):   A device for inspecting a continuously moving web, comprising
    (a)   An imaging device for sequentially imaging a portion of a continuously moving web to provide a digital data stream; and

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(b)   A single computer capable of forming a blob list from the data stream and analyzing the blob list in order to identify defects in at least a portion of said continuously moving web.

Claim 37 (Original):   A device according to claim 36, further comprising a process control system in communication with the single computer.

Claim 38 (Original):   A device according to claim 36, further comprising a marking system for marking identified defects on the continuously moving web.

Claim 39 (Currently Amended):   A device according to claim 36, wherein said imaging[[e]] device is a line scan camera.

Claim 40 (Original):   A device according to claim 36, wherein said imaging device utilizes optical assemblies which utilize reflected light, transmitted light or transflected light.

Claim 41 (Original):   A device according to claim 36, wherein multiple imaging devices are utilized.

Claim 42 (Original):   A device for inspecting flexible circuits, comprising
(a)   An imaging device for sequentially imaging a portion of a continuously moving flexible circuit web to provide a digital data stream; and
(b)   A single computer capable of forming a blob list from the data stream and analyzing the blob list in order to identify defects in at least a portion of said continuously moving flexible circuit web.

Claim 43 (Original):   A device according to claim 42, further comprising a process control system in communication with for communicating between the single computer and the process control system.

Claim 44 (Original):   A device according to claim 42, further comprising a marking system for marking identified defects on the continuously moving web.

Claim 45 (Currently Amended):   A device according to claim 42, wherein said ~~image~~ imaging device is a line scan camera.

Claim 46 (Original):   A device according to claim 42, wherein said imaging device utilizes optical assemblies which utilize reflected light, transmitted light or transflected light.

Claim 47 (Original):   A device according to claim 42, wherein multiple imaging devices are utilized.

Claim 48 (Original):   A method of inspecting a flexible circuit web, comprising analyzing blobs formed from a continuous digital data stream of at least 10 mega-pixels/second imaged from at least a portion of a flexible circuit web to identify defects on the flexible circuit web, wherein the blobs are formed and analyzed in a single computer.

Claim 49 (New):   A method comprising:
        imaging a continuously moving web to provide a digital data stream;
        forming a data structure from the data stream, wherein the data structure includes a set of objects, each object describing a set of pixels within the digital data stream that each have binary values that satisfy a connection threshold; and
        analyzing the objects of the data structure to identify defects within the web.

Claim 50 (New):   A method according to claim 49, wherein the digital data stream describes pixels in an X domain corresponding to their position across the web, and wherein forming the data structure comprises:
        determining sets of pixels that satisfy the pixel connection threshold in the X domain so as to define segments;
        resolving line to line whether connections exist between segments in a Y domain corresponding to the direction of web movement; and

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storing information within one of the objects of the data structure to describe the sets of pixels upon resolving the connections.

Claim 51 (New):   A method according to claim 49, wherein the objects store data that describe at least a start position and an end position for the corresponding set of connected pixels within the digital data stream.

Claim 52 (New):   A method according to claim 49, wherein the objects store data that describe a set of pixel segments for the corresponding set of connected pixels within the data digital stream.